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THE RELATIONSHIP OF LILIUM MICHIGANENSE

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In a recent article in this Journal[1] the characters of two east-American lilies were discussed, with the conclusion "that *L. michiganense* is not a valid species, and that all the plants included therein really belong to *L. superbum.*" Since in his studies of the soil-reaction preferences of native plants the present writer has had no difficulty in distinguishing these two lilies, further discussion seems called for.

Of the 16 characters of possible diagnostic significance considered in the article cited, 12 may be dismissed as having been disposed of, there being either no recognizable differences at all, or such as do occur being of obvious environmental origin. The four which require further attention are: leaf-indument, curvature and coloration of perianth-segments, and anther-length.[2] To these should be added ribbing of perianth-segments. The discussion should moreover be broadened to include the related *L. canadense.*

LEAF-INDUMENT. *Lilium canadense* and *L. michiganense* normally bear tiny spicules on the leaf-margins and on the dorsally projecting veins; only in rare individuals are these reduced to papillae on the veins. On the other hand, *L. superbum* has the margins and veins at most papillose, and often entirely smooth.

[1] Hull in RHODORA **44**: 220. 1942.

[2] Some years ago Mills, Proc. Iowa Acad. Sci. **31**: 265. 1926, pointed out the distinctness in these respects of *L. michiganense* as it occurs in Iowa. In the present article his observations are fully confirmed, but considerable additional data are presented.

CURVATURE OF PERIANTH-SEGMENTS. There seems to be general agreement that the curvature in *L. michiganense* is about as strong as in *L. superbum*.

COLORATION. The underlying pigment in all three is yellow. *L. canadense* occasionally has this suffused by red, the extreme being known as f. *rubrum* Britton. In *L. michiganense* and *L. superbum* the red coloring is normally abundant, vanishing only in rare mutants.

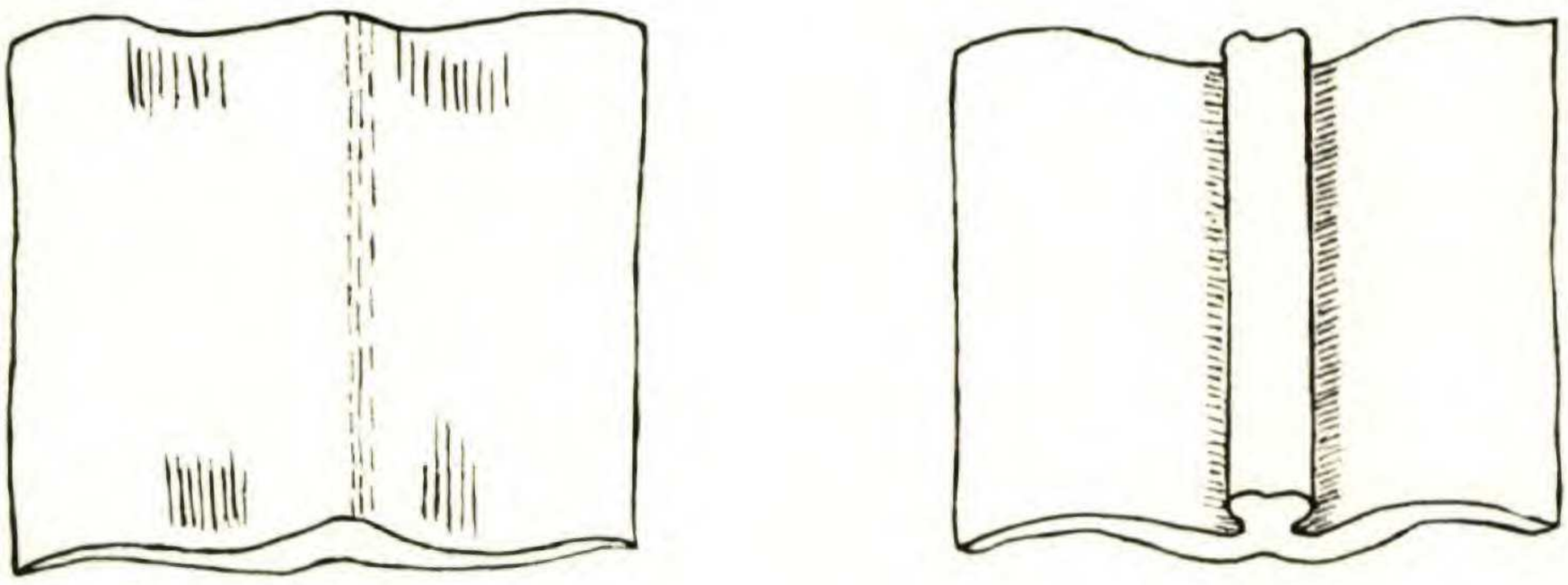

FIG. 1. Sections of sepals and petals × 2: upper, *L. canadense* and *L. michiganense;* lower, *L. superbum*.

At the base of the perianth-segments there is a translucent green zone corresponding to the glandular area the features of which are useful in classifying some other *Liliaceae*. In *L. canadense* and *L. michiganense* this green area is mostly less than 10 mm. long, has rather indistinct margins, and can not be seen when the flowers are viewed face-on. In *L. superbum* it is 10 to 15 mm. long with sharp boundaries, and can easily be seen in the flower-center.

ANTHER-LENGTH. At mid-anthesis the range is 6 to 11 mm. in *L. canadense* and *L. michiganense*, and 12 to 20 mm. in *L. superbum*. While aberrant individuals with decidedly over-size or under-size anthers are occasional, the frequency-plots are normal, with maxima at 8.5 and 16 mm. respectively.

RIBBING OF PERIANTH-SEGMENTS. The usefulness of this character does not seem to have been pointed out heretofore. In *L. canadense* the midrib of the sepals is an inconspicuous low rounded ridge; that of the petals is either rounded on the sides or at most bears very narrow horizontal ridges. In *L. superbum* the midrib of the sepals is elevated and bears a pair of erect sharp-edged ridges; that of the petals bears prominent horizontal ridges on its sides. The ribs of *L. michiganense* are of the *canadense* type. This feature is illustrated by the accompanying sketches kindly made by Mr. Hugh E. Stone.

SOIL-REACTION PREFERENCE. Circumneutral to subacid for *L. canadense* and *L. michiganense;* subacid to mediacid for *L. superbum*.

The following synoptical key will serve to separate normal individuals of these three lilies. The intermediate *L. michiganense* surely does not "belong to *L. superbum*," lying instead close to *L. canadense*. For the purposes of the ecologist, the phytogeographer, and the horticulturist all three should be maintained as distinct (though not necessarily in species status).

KEY TO THREE ENTITIES IN THE GENUS LILIUM

LEAVES bearing spicules on margins and often on veins dorsally; sepal-midrib low, rounded, inconspicuous; petal-midrib laterally rounded or barely ridged; basal green zone of perianth-segments 5 to 10 mm. long; anthers 6 to 11 mm. long; anthesis early aestival; soil-reaction circumneutral to subacid.

RECURVING of perianth-segments moderate; red pigment varying widely in intensity; range wide..... *L. canadense.*

RECURVING of perianth-segments strong; red pigment usually copious; range midland..... *L. michiganense.*

LEAVES bearing papillae or glabrous on margins and veins; sepal-midrib elevated, bearing two erect sharp ridges; petal-midrib laterally extended into prominent ridges; perianth-segments strongly recurved; red pigment usually copious; basal green zone 10 to 15 mm. long; anthers 12 to 20 mm. long; anthesis late-aestival; soil-reaction subacid to mediacid; range southern and eastern..... *L. superbum.*

The above discussion is based not only on herbarium work but also on field study of over a hundred plants, in their native habi-

tats and in the extensive garden of Mrs. J. Norman Henry at Gladwyne, Pennsylvania. My thanks are due to Mrs. Henry for pointing out the practical usefulness of the criteria here emphasized.

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EPIPACTIS LATIFOLIA IN NEW HAMPSHIRE.—In the late summer of 1942, the writer was invited to accompany Mr. and Mrs. C. A. Weatherby on a botanical collecting trip to New Hampshire and Vermont. On August 23rd the party was exploring a wooded roadside a short distance east of the Connecticut River, in the town of Plainfield, when an orchid was found which at some distance had the appearance of a *Habenaria*. Approaching near enough to see it clearly, Mr. Weatherby at once identified it as *Epipactis latifolia* (L.) All. (*Serapias Helleborine* of Gray's Manual.) Careful search revealed no more than the single individual first seen. It was growing in shaded, fairly rich soil, near the base of a small bank which sloped down from the highway. Contrary to the usual coloration of the flowers as given in descriptions, these were nearly white instead of greenish and showed little madder-purple suffusion.

According to authorities this orchid was probably introduced from Europe in early times, and in the course of years has appeared in eastern Canada, Massachusetts, Pennsylvania and New York. Mr. Charles Schweinfurth has lately reported it also from Missouri and Montana. Neither Mr. Schweinfurth nor Dr. Correll knows of any previous record of the plant for New Hampshire. Mr. Weatherby states: "the species has become established in considerable quantity near Swanton, Vermont, and Pittsfield, Massachusetts." It was found in Hartland, Vermont, just across the river from Plainfield, and also near the river, in 1925 by Mr. E. H. Hazen. This places the species close to the Plainfield station, but its actual occurrence within the boundaries of New Hampshire seems worth recording. It is probably safe to assume that, except for a single collection on trap hills in West Hartford, Connecticut (Mrs. S. M. Monks, 1931), the New Hampshire station is the farthest east so far in New England.